




School District of Philadelphia
Office of Capital Programs
Office of Environmental Management & Services
440 North Broad Street
Philadelphia, PA 19130
(215) 400-4750

TO: Patrick Henwood, Senior Vice President
Office of Capital Programs

FROM: Francine Locke, Director 
Office of Environmental Management & Services

SUBJECT: Incident Analysis Report – Elverson Military Academy

DATE: September 16, 2008

I. Overview

In August of 2008, during the demolition and replacement of heating system components at the Elverson Military Academy (MA), asbestos fibers were released from a regulated asbestos abatement work area. This release contaminated the 3rd Floor and several Basement mechanical spaces. The incident required the building to be evacuated and subsequent extensive diagnostic air-sampling throughout the facility. The incident also increased the scope of work for abatement within the facility. This report provides a description of the incident, assessment and response actions, and recommendations for prevention.

II. Background

A Mechanical Contractor was hired by the School District of Philadelphia (District) to demolish and replace heating system components at the Elverson MA over the summer of 2008. An Asbestos Abatement Contractor was hired as a sub-contractor by the Mechanical Contractor to perform asbestos abatement prior to the heating system demolition. The asbestos abatement portion of the project was overseen by an environmental professional consulting firm hired by the District's Office of Environmental Management & Services (OEMS).

The environmental consultant hired by OEMS was responsible for the following tasks:

- 1) Inspection of the mechanical systems to identify asbestos-containing building materials prior to their impact by mechanical work
- 2) Completion of an Asbestos Inspection Report (AIR) form that identified all impacted building materials that contain asbestos.
- 3) Design of an asbestos abatement scope of work for the Asbestos Abatement Contractor, including asbestos exposure prevention controls.
- 4) Perform as a licensed Asbestos Project Inspector (API) of record, duties of which include conducting air-monitoring during and after abatement, and ensuring the Asbestos Abatement Contractor's compliance with the City of Philadelphia's Asbestos Control Regulations.
- 5) Act as the Asbestos Project Manager to oversee and document the abatement project on the District's behalf.

III. Description of Incident

In the summer of 2008, as part of a heating system demolition project, asbestos abatement was scheduled to be performed in the Main Attic of Elverson MA. In August, the Asbestos Abatement Contractor and the API of record informed OEMS that the Main Attic passed a visual inspection and was ready for final clearance air-sampling. On August 7, 2008, the API of record and the PFT H&WF Environmental Scientist's designee performed side-by-side clearance air-sampling in the Main Attic abatement work area. The sample results indicated that the work area failed re-occupancy criteria set forth by the City of Philadelphia's Asbestos Control Regulations, and therefore the Asbestos Abatement Contractor was directed by the API of record to re-clean the Main Attic.

On August 15, 2008, the API of record and the PFT H&WF designee again collected side-by-side clearance air-samples inside the Main Attic. The results indicated that the work area again did not pass clearance criteria. On August 16, 2008, because of the two air-sample failures and an observation made by the PFT H&WF indicating negative pressurization failure in the Main Attic and other issues including visual debris outside the work area, the Asbestos Project Manager was directed by OEMS to assess the airborne asbestos levels in 3rd Floor areas directly outside of the Main Attic work area.

On August 18, 2008, the outside air-sample results from the 3rd Floor indicated elevated concentrations of airborne asbestos. The PFT H&WF Environmental Scientist was notified by OEMS of the air-sample results on August 18, 2008, and the building was evacuated by OEMS that day. The 3rd Floor was isolated and contained by the Asbestos Abatement Contractor.

IV. Immediate Response Actions

On August 18, 2008, an emergency meeting was held on-site with OEMS, the Asbestos Abatement Contractor, the API of record, the Asbestos Project Manager, the PFT H&WF Environmental Scientist, the Project Manager, and the Building Engineer. The purpose of the meeting was to discuss potential sources of asbestos contamination and to identify immediate corrective actions. Another meeting was held immediately thereafter with the PFT H&WF, OEMS and a senior level employee of the environmental consulting firm hired to perform Asbestos Project Management at the Elverson MA project. The purpose of this meeting was to determine a strategy for diagnostic air-sampling for the rest of the building to assess the extent of contamination within the building.

During the week of August 18, 2008, a comprehensive Asbestos Hazard Emergency Response Act (AHERA) building inspection was performed as a precaution at Elverson MA to identify any other potentially damaged asbestos-containing building materials in the facility. Diagnostic air-monitoring was conducted throughout Elverson MA by OEMS' asbestos consulting firm and the PFT H&WF. The Basement common areas, 1st and 2nd Floors were released sequentially that week following acceptable air-sampling results. The 3rd Floor and Main Attic were simultaneously cleaned, air-sampled and released for re-occupancy later that week. The Basement Mechanical Areas were identified as suspect for asbestos contamination due to a relationship between an air-shaft and the Main Attic. This area was contained and is currently in the process of cleaning as an asbestos contaminated space. Aggressive air-sampling will be performed before this area is released for occupancy.

A letter from OEMS was sent home with students on the first day of school indicating what happened over the summer and what was being done to correct the problem. The letter also invited the community to a meeting to discuss the issue. The community meeting was held by OEMS at Elverson MA on Friday, September 5, 2008.

V. Findings

As a result of OEMS' investigation of this incident, several factors were identified as causing the contamination of the 3rd Floor and Basement Mechanical Spaces. These factors are as follows.

1. Penetrations in 3rd Floor Ceiling

Penetrations in the 3rd Floor plaster ceiling were generated by the Asbestos Abatement Contractor who was working in the Main Attic. Specifically, holes were created in the 3rd Floor plaster ceiling due to a lack of planking/platforms that should have been properly installed to distribute the weight of workers and equipment in the Main Attic. The penetrations resulted in multiple breachings of the Main Attic's containment, hence, increasing the size of the regulated work area from the Main Attic to include the 3rd Floor classrooms and hallways. The expansion of the regulated work area was not immediately identified, and as a result, the Building Engineer directed his cleaning staff to perform general cleaning tasks in the classrooms where penetrations were made between the Main Attic and the 3rd Floor. This resulted in a documented occupational exposure incident for the Building Engineer and the cleaning staff. The basis for the occupational exposure incident was TEM air-sampling performed on the 3rd Floor during final air-sampling in the attic which indicated elevated levels of asbestos in areas outside of the containment. The Building Engineer reported that he expressed his concerns about the holes in the ceiling to the API of record, but the API dismissed his concerns. There is documentation that the API asked the Asbestos Abatement Contractor to fix the damaged ceiling plaster, but did not indicate that he had any concerns with a connection between the regulated work area in the Main Attic and the contamination of spaces below.

2. Negative Pressurization Failure in Attic

According to observations made by a designee of the PFT, H&WF's Environmental Scientist, air-filtration devices were not functioning properly at the time of final clearance air-sampling in the Main Attic. Upon further investigation by a senior member of the asbestos consulting firm hired by the District to manage the project, it was identified that the Asbestos Abatement Contractor did not have an adequate number of properly functioning air-filtration devices to achieve negative pressurization within the containment of the Main Attic for the duration of the abatement. Inadequate negative pressurization within the asbestos containment resulted in air escaping the containment and presumably contaminating adjacent outside areas on the 3rd Floor. The API of record failed to measure and document quantitative pressurization readings from a manometer inside the containment during the project as is required by the Philadelphia Asbestos Control Regulations. Furthermore, the senior member of the asbestos consulting firm hired to manage the project performed a visual inspection of the Main Attic and determined that it should never have passed the initial visual inspection. He instructed the Asbestos Abatement Contractor to re-clean the Main Attic before further air-sampling could be performed for clearance.

3. Deviation from Abatement Design Specification – Use of Air-Shaft as Waste Removal Chamber

The Asbestos Abatement Contractor used a ventilation air-shaft to transport asbestos waste bags from the Main Attic to the Basement for disposal. The abatement scope of work did not indicate a specific route of travel for waste transport. However, the use of the air-shaft was improper because the bag-out chamber located at the base of the air-shaft was removed prior to completion of the decontamination of the Main Attic, and prior to final aggressive air-sampling for re-occupancy. Because a controlled work space was breached by the removal of the bag-out decontamination chamber, the Basement mechanical space(s) was deemed contaminated and required cleaning and clearance through air-testing before re-occupancy.

4. Failure to Identify and Report

The environmental consulting firm hired by the District to perform Asbestos Project Inspector (API) and Asbestos Project Management duties during asbestos abatement activities failed to identify and report to OEMS critical work practice and engineering control failures by the Abatement Contractor. These failures resulted in the contamination of areas outside of the Main Attic at Elverson MS.

VI. Recommendations for Prevention

- 1) Require all sub-contracting asbestos abatement firms to be prequalified.

- 2) Improve OEMS control over Asbestos Abatement Contractors and asbestos consultants. To accomplish this goal, all asbestos consulting firms and their designated APIs must:
 - a) Provide notification to OEMS management prior to scheduling final clearance air-sampling. This will allow OEMS to visually inspect work areas prior to their final air-sampling.
 - b) Complete checklists of abatement milestones including pre-cleaning inspection, pre-abatement inspection, two daily work area inspections, pre-encapsulation, and final clearance inspections. These checklists will require API sign-off prior to each phase of abatement. Photographs will also be attached to the signed checklist.
- 3) Review the qualifications of APIs and Asbestos Project Managers and only approve those who are professionally suitably to work for District projects. Criteria for evaluation to include prior work history and references.
- 4) Provide project management with asbestos awareness training.
- 5) Improve communication between OEMS, construction management, asbestos consultants, and building occupants (including Facilities Management staff such as the Building Engineer). This can be accomplished through directing OEMS' asbestos consultants to attend all construction progress meetings and reporting to OEMS building occupant and Project Management concerns expressed about an abatement project. All such concerns must be taken seriously and fully investigated and reported to OEMS by the consulting firm managing the abatement project.